



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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ALAMEDA POINT
SSIC NO. 5090.3

October 12, 2001

Glenna Clark
BRAC Operations, Code 06CA.GC/0718
Department of the Navy, Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, CA 92101

RE: **Draft Project Plans, Air Sparging/Soil Vapor Extraction for Removal Actions
Installation Restoration Sites 9, 11, 16 and 21, Alameda Point**

Dear Ms. Clark:

EPA is submitting comments to the Navy on the above referenced document, prepared by IT Corporation and sent to the regulatory agencies on August 10, 2001. EPA's contractor, Tech Law Inc, has reviewed the document for technical adequacy and has indicated concern that the AS/SVE tests have not been sufficiently well thought out and designed. EPA acknowledges that hydrogeologic conditions at Sites 9, 11, 16 and 21 are not well understood and the vertical and lateral extent and concentrations of the contaminant plumes are still being determined through data gap sampling that commenced in June of this year. However, even with these uncertainties, it appears that the pilot study AS/SVE test needs to be more carefully designed in order to be able to succeed in removing volatile contaminant mass from the subsurface.

Feel free to call me at (415) 744-2367 to set up a conference call or meeting with EPA and Tech Law to further discuss the enclosed comments.

Sincerely,

A handwritten signature in cursive script that reads "Anna-Marie Cook".

Anna-Marie Cook
Remedial Project Manager

enclosure

cc list next page

cc: Michael McClelland, SWDiv
Andrew Dick, SWDiv
Daniel Murphy, DTSC
Dennis Mishek, RWQCB
Karla Brasaemle, Tech Law Inc
Elizabeth Johnson, City of Alameda
Michael John Torrey, RAB Co-Chair

**EPA Review of the Draft Project Plans, Air Sparging/Soil Vapor Extraction for
Removal Actions Installation Restoration Sites 9, 11, 16 and 21
Alameda Point, California**

GENERAL COMMENTS

1. It appears that most of the SVE extraction well screens will be below the water table. Groundwater will be pumped from the SVE wells, but the pilot test will be of very short duration (8 hours), so the zone of influence will be small and therefore, the soil that will be exposed and amount of contamination that can be removed will also be small. Most of the time will be spent dewatering the pore spaces, so it may not be possible to evaluate whether the formation is transmissive to air. Please explain why it is appropriate to screen SVE wells below the water table, given that the pilot test will be too short to develop a significant zone of influence. Please also explain the short duration of the test.
2. The depth to groundwater, which is important for setting the screened intervals of Soil Vapor Extraction (SVE) wells and to evaluate the potential effectiveness of the removal actions, is not discussed in the text. Please specify the depth to groundwater at each Installation Restoration (IR) Site.
3. The vertical extent of contamination is not discussed for IR Sites 9 and 16 and there are no cross-sections. Hydropunch groundwater samples were collected at various depths to as much as 45.5 feet. The text states that a clay layer is missing at several points and that the "well cemented, potentially low permeability layer" is not prevalent at these sites. Without cross-sections to understand the extent of low permeability layers and without an understanding of the vertical extent of contamination, it is unclear whether SVE and Air Sparging (AS) will be effective. The depth of contamination is not discussed, nor is the vertical hydraulic gradient, so it is unclear if the treated areas could become recontaminated if, for example, contaminated groundwater moves upward from a contaminated zone that is deeper than the zones to be treated. Please provide at least one cross-section with stratigraphic layers and post the concentrations of the contaminants of concern (COCs) at the appropriate depths for each boring at each IR site. Also, please discuss the vertical extent of contamination in the text, including whether there is contamination in the vadose zone.
4. Helium will be injected during the AS pilot test, but it is unclear if helium will also be used during full scale implementation. Please explain why helium was chosen and clarify whether helium will be used for full scale implementation.

SPECIFIC COMMENTS

1. **Section 2.0, Pilot Testing Overview, Page 2-1, and Field Sampling Plan (FSP) Section 1.1, Purpose and Scope, Page 1-2:** The text states that “appropriate modifications to site activities will be made” if nonaqueous phase liquids (NAPLs) are observed, but neither the work plan nor the FSP discuss possible modifications. Please specify the modifications that will be made if NAPLs are observed.
2. **Section 3.2, IR Site 9, Page 3-1:** The text states that there are 4 monitoring wells and 17 hydropunch locations, but only 3 monitoring wells and 8 hydropunch locations are shown on Figures 1 and 2. Please resolve this discrepancy. The text mentions deep monitoring well D-09-01 and location B410-9 but neither of these locations are shown on Figures 1 or 2. Please include all locations discussed in the text on a figure.
3. **Figures 3 and 4:** In the legend on Figure 4, the yellow diamond is labeled “proposed pilot test extraction point” but on Figure 3, this same symbol is labeled “existing monitor well.” Please resolve this discrepancy.
4. **Section 3.3, IR Site 16, Page 3-2 and Figure 3:** Buildings 402, 586, 608 and 620 are discussed in the text, but only building 608 is labeled on Figure 3. Please label these buildings on a figure. Also, it is unclear if the 27 identical rectangles in the eastern part of IR Site 16 are also buildings. Please either discuss these features in the text or include this symbol in the legend.
5. **Section 3.3, IR Site 16, Page 3-2 and Figure 3:** The text states there were 5 Geoprobe borings where groundwater samples were collected, 4 monitoring wells and one piezometer. Figure 3 shows 6 “assessment points.” It is unclear where the 5 groundwater samples were collected and where the piezometer is located. Please clearly indicate where the groundwater samples were collected. Please also clarify if data from the other assessment points and monitoring wells outside the pilot test area were used to produce the contaminant concentration contours on Figure 4.
6. **Figure 4:** The maximum vinyl chloride and 1,2 dichloroethene (1,2 DCE) concentrations are unclear because there are no contours in the north and east and the detected concentrations are not posted. Please explain why the vinyl chloride and 1,2 DCE contours are truncated. Please clearly indicate the location and magnitude of the maximum concentrations of these compounds in the areas where the proposed pilot tests will be conducted.
7. **Section 3.4, IR Sites 11 and 21, Page 3-3 and Figures 5 and 6:** The text states that benzene is a contaminant of concern (COC) but detections of benzene are not listed on Figure 5 or shown on Figure 6.

8. **Section 3.4, IR Sites 11 and 21, Page 3-4:** The distribution of benzene in groundwater is not discussed in the paragraph on COCs. Please discuss the horizontal and vertical distribution of benzene.
9. **Section 3.4, IR Sites 11 and 21, Page 3-3 and FSP Section 2.4, Page 2-2:** In Section 3.4, the area of IR Site 21 is 7 acres, but in Section 2.4 of the FSP, the area is stated to be 21 acres. Please resolve this discrepancy.
10. **Section 4.1, Pilot Test Well Grid Configuration, Page 4-1 and Figure 9:** The text states that a "typical well grid is presented on Figure 9" and "the well grid will consist of ... five SVE wells." Figure 9 has seven SVE wells. Please resolve this discrepancy.
11. **Section 4.1, Pilot Test Well Grid Configuration, Page 4-1 and Figure 9:** It is unclear why three monitoring wells are installed upgradient, one well is cross-gradient, one well is up/cross-gradient, and only one well is installed downgradient. Downgradient monitoring is important because it is likely that higher levels of contamination are located downgradient than upgradient and because contaminants are migrating downgradient. Please explain why the monitoring well configuration is biased toward upgradient monitoring or change the configuration so that the effectiveness of SVE on downgradient areas can be assessed.
12. **Table 2 and Figure 10:** There appear to be some math errors in Table 2. Based on information in Table 2, the minimum length of the sand pack above an SVE extraction well or monitoring well screen is 0.5 feet and the minimum screen length is 5 feet. According to Figure 10, each monitoring well will have a 2.0 foot sump below the well screen. This gives a total minimum sand pack length of 7.5 feet, but the minimum length in Table 2 is 9.5 feet for monitoring wells and 8 feet for SVE extraction wells. Please resolve these discrepancies. Also, please review the depth to the well sump in Table 2, based on a water table depth of 6 to 8 feet and revise the minimum depth as necessary.
13. **Section 4.2, Boring and Well Drilling and Installation Procedures, Pages 4-2 and 4-3:** The grain size of the filter pack material is not specified. Please specify the grain size of material that will be used as filter pack material. Also, please indicate if coarser filter pack material will be used for the SVE and AS wells, and if not, explain why not.
14. **Section 4.2, Boring and Well Drilling and Installation Procedures, Page 4-4:** The text only specifies that the location and elevation of the monitoring wells will be surveyed. It is unclear if the SVE and AS wells will also be surveyed. Please indicate whether SVE and AS wells will be surveyed.
15. **Section 4.3.1, IR Site 9, Page 4-4, and FSP, Section 4.3.1, IR Site 9, Page 4-3:** The text states that "the long axis of the well grid will be oriented east-west." Figure 9 shows that the long axis of the well grid should be oriented along the groundwater flow direction.

According to the text in Section 3.2, the groundwater flow direction at IR Site 9 is west-southwest. Please explain why the well grid will not be aligned with the groundwater flow direction.

16. **Section 4.3.2, IR Site 16, Page 4-5, and FSP, Section 4.3.2, IR Site 16, Page 4-3:** The text states that "the long axis of the well grid will be oriented east-west." Figure 9 shows that the long axis of the well grid should be oriented along the groundwater flow direction. According to the text in Section 3.3, the groundwater flow direction at IR Site 16 is to the northwest. Please explain why the well grid will not be aligned with the groundwater flow direction.
17. **Figure 11 and FSP Figure 5:** The Tetra Tech proposed sample locations are light green and the 5 µg/L isoconcentration plume is bright green. As a result, the Tetra Tech proposed sampling locations cannot be distinguished within the plume boundary. Please use a different color for the Tetra Tech proposed sampling locations so that they can be distinguished.
18. **Section 4.3.3.1, Additional Remedial Design Sampling - Sites 11 and 21, Page 4-6 and FSP Section 4.3.4, Additional Remedial Design Sampling - Sites 11 and 21, Page 4-5:** Permanganate will not be used at IR Sites 11 and 21 during the AS/SVE study and oxygen is not being injected into the AS wells, so it is unclear why permanganate test kits will be used or why it is necessary to evaluate in-situ oxidation. Please explain why permanganate test kits will be used, how the data will be interpreted and how the data will be used for the AS/SVE tests.
19. **Section 4.5.7, Air Sparge/SVE Testing, Page 4-12, FSP Section 4.4.7, Air Sparge/SVE Testing, Page 4-9 and FSP Section 4.4.8, Air Sparge/SVE Test Setup, Page 4-9:** The text in Section 4.5.7 and FSP Section 4.4.7 states that 4 SVE wells will be used, but the test in FSP Section 4.4.8 references 5 SVE wells. Please resolve this discrepancy.
20. **FSP Section 1.1, Purpose and Scope, Page 1-1:** The third bullet does not include 1,1 DCE which is listed as a COC in Section 3.4 of the Work Plan. Please resolve this discrepancy.
21. **FSP Section 2.4, IR Sites 11 and 21, Page 2-2:** The list of COCs does not include 1,1 DCE which is listed as a COC in Section 3.4 of the Work Plan. Please resolve this discrepancy.
22. **FSP Section 4.2, Borehole Soil Sampling:** This section also includes information on well construction, which is not listed in the section title and could therefore be difficult for field personnel to locate. Please revise the section title or move the well construction information to a separate section.

23. **FSP Section 4.2, Borehole Soil Sampling, Page 4-2:** The text states “the borehole will be of sufficient diameter so that well construction can proceed without difficulties.” The well casing diameters are known, so the borehole diameters can be specified. To aid field personnel, please specify an acceptable range of borehole diameters for 2 inch and 4 inch diameter wells.
24. **FSP Table 2:** Water samples for metals analysis must also be chilled. Please add a statement about cooling to the “CCR T22 Metals” preservative column.
25. **FSP Section 5.3.1, Field Duplicates, Page 5-2, Section 5.3.2, Equipment Rinsate Samples and Table 3:** According to Section 5.3.1, duplicate soil samples will be collected and according to text in Section 5.3.1, equipment rinsate samples will be collected but Table 3 indicates that no Quality Control Samples (QC) samples will be collected. Please add field duplicates and equipment rinsate blanks for soil samples to Table 3.
26. **FSP, Section 6.5, Vapor Sampling Procedures, Page 6-4 and Section 6.7, Decontamination Procedure, Page 6-5:** There is no discussion of the need to decontaminate the air-tight fittings that will be used for vapor sampling. Please specify that air-tight fittings must be decontaminated in Section 6.5 and provide procedures for decontamination in Section 6.7, or explain why decontamination is not necessary.
27. **FSP, Section 6.10, Sample Packaging and Shipping, Page 6-7:** The second full paragraph begins with the statements:
- “Samples will be packed in a sample cooler lined with a plastic bag. Ice, double bagged in resealing bags, will be added to the cooler in sufficient quantity to keep the samples cooled to 4 ± 2 °C for the duration of the shipment to the laboratory.”
- These procedures are not appropriate for vapor samples, and separate packaging and shipping procedures are not provided for vapor samples. Please specify that these procedures are for soil and water samples and provide separate procedures for vapor samples.
28. **Quality Assurance Project Plan(QAPP), Section 3.1.2 Identify the Decision, Page 3-2:** This section states the “principal decision” is whether AS/SVE is applicable and effective for removing subsurface contamination but does not list the other decisions that involve alternative remediation approaches such as chemical oxidation or natural attenuation processes. Please discuss how decisions regarding these other processes will be incorporated into the overall project planning, and whether the data obtained will allow the definitive selection of an alternate technology or require additional site characterization for these decisions to be made.

29. **QAPP, Section 3.1.3 Identify Inputs to the Decision, Page 3-2:** The listed measurements are not all necessarily related to the AS/SVE process. Please identify the measurements that are critical or informational for the design of an AS/SVE system, as well as the use of the other data. Please also consider including Total Organic Carbon analyses of groundwater because such data are also useful for assessing intrinsic biotransformations and chemical oxidation processes.
30. **QAPP, Section 3.1.5 Developing a Decision Rule, Page 3-3:** These rules state that the AS/SVE design will proceed if the various measurements indicate the data are "appropriate" or "sufficient", but there are no quantitative criteria cited. In addition, there is no indication of whether any of these criteria are more important than others in the decision to proceed to full scale design nor is there any indication that design modifications could be implemented (e.g., in the case where the radius of influence is small, the SVE extraction well spacing can be adjusted). Please provide quantitative criteria for critical measurements that would be "show-stoppers" for further consideration of AS/SVE. Please also consider providing a decision tree that would indicate both the priority of these decisions and whether any problems can be overcome by adjusting the design.
31. **QAPP, Section 3.1.6 Specifying Limits on Decision Error, Page 3-4:** This step states that the "number and types of samples to be collected are based on existing experience with similar projects and applicable regulatory guidance" but none of this experience has been presented in this Sampling and Analysis Plan (SAP). Presumably this experience has been applied in the design of the AS/SVE pilot study, but criteria for deciding to proceed with AS/SVE design that should follow from this experience are not demonstrated in this SAP. Please provide criteria based on this existing experience as well as where and how elements of regulatory guidance has been included in this SAP.
32. **QAPP, Section 3.2 Analytical Data Quality Objectives, beginning on Page 3-4, through Section 9 References:** The remainder of the QAPP appears to be of boiler plate quality, and while generally appropriate for soil and water samples, some sections do not apply to vapor/gas samples. For example, Section 3.3.2 (on Precision) does not list criteria for vapor samples, and Section 5.1 (on Chain of Custody) implies that vapor samples will be chilled. While Table 10 does address some QAPP issues for EPA Method TO-14A, please develop QAPP sections that are specific to vapor/gas samples and which recognize the very different character, sampling and analytical quality concerns for vapor samples.